

Remarks

Claims 3-32 were rejected under 35 U.S.C. §102(b) as being anticipated by Jewell (U.S.P.N. 5,859,864). Claims 3-32 were rejected under 35 U.S.C. §102(b) as being anticipated by Lebby, *et al.* (U.S.P.N. 5,848,086).

35 U.S.C. §102(b) – claims 1-32

Claims 3-32 were rejected under 35 U.S.C. §102(b) as being anticipated by Jewell (U.S.P.N. 5,859,864).

In the Figure 4a, Jewell shows the aperture of the VCSEL lying in a plane parallel to the substrate. Figures 2a-2d and 3a-3b in the Jewel patent are diagrams showing coherent strain relaxation. These diagrams show planar atomic planes parallel to the substrate and non-planar atomic planes perpendicular to substrate. Each plane parallel to the substrate surface is planar. The lattice constants are on the order of 5.65 Angstroms for GaAs (col. 7, line 42) and 71.9 Angstroms for InGaAs (col. 8, line 6). In particular, Jewell teaches using a transition region between the two disparate lattice constants. The transition region includes a lattice constant of grown material that gradually varies. While Jewell introduces a lattice mismatch, he fails to introduce a “phase mismatch” in a plane parallel to the aperture as the Applicants have.

In distinct contrast to Jewell, the present invention teaches including a light emission property that **“varies within the aperture”** of the VCSEL (page 7, lines 8-10 of the specification). Nowhere does Jewell teach or suggest **varying a light emission property within the aperture** of a VCSEL. Furthermore, Jewell neither suggests nor teaches introducing a non-planar surface within a plane parallel to the aperture.

Currently amended claim 3 recites “a light emission property that varies within the aperture.” Support from the specification is cited above. Claim 3 is believed to be patentable. Claims 4-27 are believed patentable based on the allowability of claim 3. Independent claims 28 and 30-32 now recite “a layer having a textured surface.” Independent claims 28, 30, 31, and 32 are believed to be patentable. Claim 29 is believed patentable based on the allowability of claim 28. No new matter is being introduced with this amendment.

35 U.S.C. §102(b) – claims 1-32

Claims 3-32 were rejected under 35 U.S.C. §102(b) as being anticipated by Lebby, *et al.* (U.S.P.N. 5,848,086).

Lebby, *et al.* discloses a VCSEL having a first stack of distributed Bragg reflectors disposed on a surface of a semiconductor substrate. In particular, the substrate includes a dot pattern to define the lasing surface of the VCSEL (col. 6, lines 46-48). Lebby teaches the use of a non-planar AlAs to add controllability to the partial oxidation of this layer; it is this partially oxidized layer that defines the current aperture. The teaching explains that the oxidation front moves more slowly through the step region because it is thinner and hence makes the ultimate length of the oxide layer more controllable. The step texture exists outside (not within) the final current aperture of the device.

In distinct contrast to Lebby, *et al.*, Applicants teach “varying a light emission property within the aperture” of a VCSEL. In particular, the light emission property is a non-planar surface within a plane parallel to the aperture is introduced. Nowhere does Lebby, *et al.* teach or suggest that any variable light emission property be included in the device structure. Hence, Lebby, *et al.* neither suggests nor teaches using a non-planar surface within a plane parallel to the aperture to provide a variable light emission property within the aperture.

Currently amended claim 3 recites “a light emission property that varies within the aperture.” Support from the specification is cited above. Claim 3 is believed to be patentable. Claims 4-27 are believed patentable based on the allowability of claim 3. Independent claims 28 and 30-32 now recite “a layer having a textured surface.” Independent claims 28, 30, 31, and 32 are believed to be patentable. Claim 29 is believed patentable based on the allowability of claim 28. No new matter is being introduced with this amendment.

Conclusion

If the Examiner has any further questions or would like to discuss this application in more detail, he is invited to call the applicants' agent at the telephone number given below. The applicants respectfully suggest that the claims presently in the application are distinct over the prior art and that the application is now in condition for allowance. Accordingly, the applicants solicit favorable action.

Respectfully submitted,
Schneider, *et al.*

Pamela Lau Kee

Pamela Lau Kee
Patent Reg. No. 36,184

January 30, 2004
Agilent Technologies
Intellectual Properties Administration
Legal Department, M/S DL-429
815 SW 14th Street
Loveland, CO 80537
(408) 553-3059